IRR
5011

Guidelines for Reducing Budworm Damage

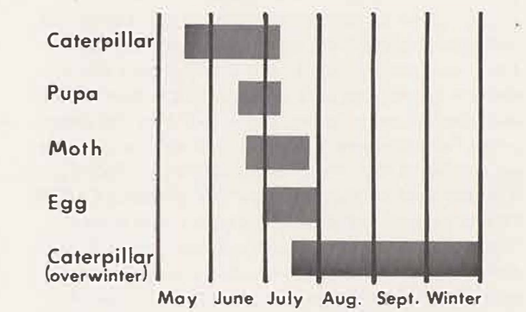
Spruce budworm suppression is not warranted, at this time, on forested land. However, under urban conditions the budworm can become much more damaging and the homeowner may need to select one of the following control alternatives:

***Alternative** I: If budworm feeding is low to moderate and spruce trees are vigorous, damage is minimal. The use of pesticides is usually not necessary. However, the following steps should be taken:

- Care should be taken to avoid damaging the trunk, injuring the roots, altering the drainage patterns or severely compacting the soil.

- Spring fertilization helps promote tree vigor. The USDA Cooperative Extension Service recommends one to two pounds of fertilizer per one inch of tree diameter, applied by making a concentric series of holes, 8-10" deep around the tree starting two feet from the trunk and extending a few feet beyond the dripline. Fertilization should begin in the spring and continue through the summer. Stop fertilization prior to the tree going into fall dormancy. Any complete lawn or garden fertilizer high in phosphorus is adequate. This feeding program may not be necessary every year. Fertilizer uptake, soil type, rainfall, weather and grass cover will all determine the time of reapplication.

***Alternative** 2: If ornamental spruce have shown signs of heavy budworm feeding for two or more consecutive years, chemical treatment may be warranted. Insecticides should be applied from mid-May to early June when budworms are beginning to feed on expanding new growth. The young caterpillars are susceptible to chemical treatment at this time and damage can be kept to a minimum.



Budworm adult (Variation in color pattern)

There are a number of insecticides containing Carbaryl, Dimethoate and Malathion which are registered by the Environmental Protection Agency for budworm suppression.

Additional information on this insect can be obtained from your local USDA Cooperative Extension Service, Alaska State Forestry Office, or from -

Forest Insect and Disease Management
State and Private Forestry
USDA Forest Service
2221 E. Northern Lights Blvd.
Suite 107
Anchorage, Alaska 99504
PH: 276-0939

Caution: Pesticides can be injurious to humans, domestic animals, desirable plants, and fish or other wildlife - if they are not handled or applied properly. Use all pesticides selectively and carefully. Follow recommended practices for the disposal of surplus pesticides and pesticide containers. Mention of a pesticide in this publication does not constitute a recommendation for use by the USDA, nor does it imply registration of a product under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended. Mention of a proprietary product does not constitute an endorsement by the USDA.

The Spruce Budworm: A Pest of Alaska White Spruce, by Edward Holsten, U.S. Department of Agriculture, Forest Service, Alaska Region, State and Private Forestry, Alaska Region leaflet number 99, May 1980

★ GPO 1980 698-647

The Spruce Budworm: A Pest of Alaska White Spruce

United States Department of Agriculture

Forest Service

Alaska Region Leaflet Number 99

The Spruce Budworm: A Pest of Alaska White Spruce

By Edward Holsten, Entomologist, USDA Forest Service, Anchorage

Spruce and fir forests throughout North America suffer annual losses in terms of growth and productivity due to infestations of the spruce budworm (*Choristoneura* spp.). In Alaska, infestations of white and Sitka spruce forests have been negligible prior to 1978. At this time significant budworm damage was detected on white spruce in many residential and park areas of Anchorage. Subsequent surveys revealed low levels of budworm activity from the Kenai Peninsula to Fairbanks.

Overall, budworm damage to Alaska spruce forests is negligible. However, under urban conditions, the spruce budworm appears to be much more damaging in terms of affecting host vigor and aesthetics. This brochure is intended to provide the homeowner with a description of budworm damage, life history and guidelines to help reduce budworm damage.

Tree Damage

The spruce budworm in Alaska is primarily a pest of white and Sitka spruce. Damage results when budworm caterpillars (larvae) eat the buds and needles of the tree causing the foliage to turn reddish-brown. In most cases, feeding is restricted to the new growth but when heavy infestations occur older needles are also consumed. Consecutive years of heavy feeding can result in complete defoliation and an increase in bud killing resulting in:

Top-killing may occur resulting in forked or multiple leaders. Top-killing can affect the eventual merchantable tree height in forest situations and adversely affect tree aesthetics under urban conditions.

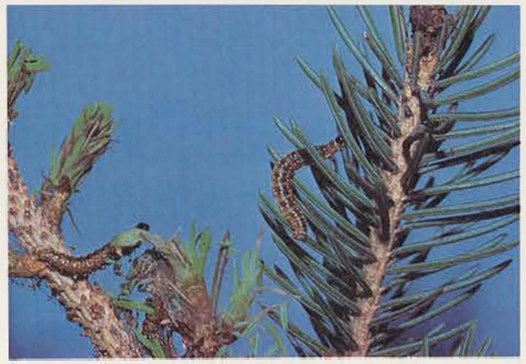
Growth is reduced relative to the intensity of defoliation. This is of little concern in urban situations unless rapid growth is desired for overall landscape balance. However, under forest conditions intense defoliation can cause a significant reduction in wood production in merchantable forest stands.

Tree Death has rarely occurred in Alaska from budworm feeding. However, potential tree mortality exists in urban situations where spruce are under greater stress and subsequently less healthy and vigorous than those in forests. This is often the case in areas of new construction where trees are mechanically damaged and soil is compacted or placed on top of the root system in excess amounts.

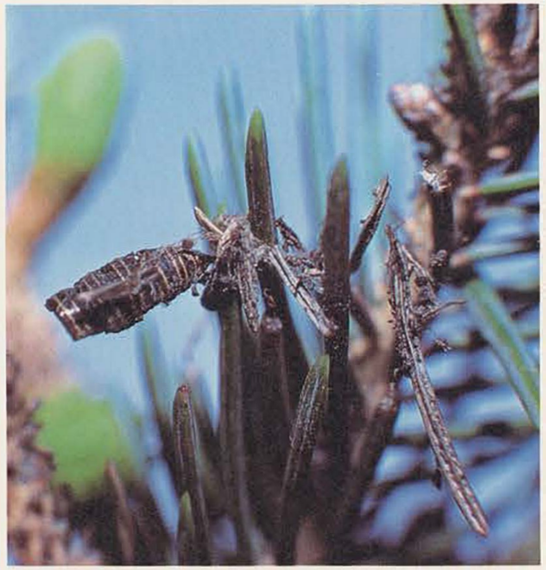
Moderately defoliated white spruce.

Life History

The ADULT budworm is a medium sized moth about 1/2 inch long. There is a variety of wing coloration ranging from orange-brown to grey. Adults emerge from their pupal cases among the foliage from mid-June to mid-July. Adults are active throughout the late afternoon and early evening. The moths can be carried up to ten miles by normal winds or hundreds of miles by storm fronts. The female lays greenish EGGS in a shingled mass on spruce needles in the area of previous caterpillar feeding sites. The young pale-cream caterpillars emerge in about ten days. The young caterpillars do not feed but spin silken shelters in twig and bark crevices where they remain until the following spring. About mid-May the caterpillars bore into new buds and feed on new developing needles. Later, the growing caterpillars loosely web and feed on the new growth. Full grown CATERPILLARS are about an inch long with dark brown heads and bodies with prominent light colored spots along the back. From mid-to-late June mature caterpillars transform into pupae (transitional stage of about ten days from caterpillar to moth). PUPAE are reddish-brown to black in color, about 1/2 inch long, and are normally found within the webbing previously formed by feeding caterpillars.



Budworm larvae.



Pupal case.

Budworm adult (common color pattern).